SPECTROSCOPIA MOLECULAR

UN PERIODICO MENSUAL DE NOVAS E INFORMATIONES DE INTERESSE E VALOR AL SPECTROSCOPISTAS MOLECULAR

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SPECTROSCOPIA MOLECULAR ha essite redigite e publicate mensualmente depost Maio 1952 per Prof. Forrest F. Cleveland del Departimento de Physica del Instituto Technologic de Illinois in Chicago. Pro assecurar un plus facile lectura per le plus grande numero del spectroscopistas, le periodico es scribite in le lingua international, Interlingua. Manuscriptos e novas e informationes, tanto como abonamentos e ordines pro monographias, debe esser inviate a

Spectroscopia Molecular
Departimento de Physica
Instituto Technologic de Illinois
Chicago 16, Illinois, S. U. A.

Le texto original es legite per Dr. Alexander Gode, Chef del Division de Interlingua de Science Service (80 East 11th St., New York 3, N. Y., S.U.A.). Libros super Interlingua, disponibile ab ille adresse, es Interlingua-English Dictionary, Interlingua Grammar, Interlingua A Prime Vista, Interlingua in 20 Lektionen, Interlingua en 20 Leçons, Interlingua in 20 Lezioni, e Homo Sonetticus Moorensis (un bellemente imprimite parve libro de poemas con illustrationes).

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Companias pote attachar un pagina de informationes in re lor productos, si illos es de interesse a spectroscopistas molecular.

MONOGRAPHIAS. Duo monographias es disponibile. Illos es:

Spectros Molecular. I. Regulas de Selection pro Spectros Vibrational de Moleculas Polyatomic, per Forrest F. Cleveland, 1953, 25 paginas, $0.75 nette.

Spectros Molecular. II. Tractamentos del Coordinatas Normal de Moleculas Polyatomic, per Salvador M. Ferigle e Alfons Weber, 1955, 30 paginas, $1.00 nette.

SPECTROSCOPIA MOLECULAR

Un bulletin mensual de novas e informationes de interesse e valor al spectroscopistas molecular

Volumine 6 | Februario 1957 | Numero 58

CONSTANTES DEL ENERGIA POTENTIAL PRO HNO_2

Ann Palm

Division de Chimia
Laboratorio de Radiation
Universitate California
Livermore, California, S. U. A.

(Recipite le 19 de octobre 1956)

Un tractamento del coordinatas normal esseva facite pro le isomeros rotational de HNO_2. Gruppos possibile del constantes de fortia esseva evalutate ex le bandas vibrational previemente observate. Le limites probabile del constantes esseva establite per le criterio del ordine de ligamine e per le distributiones del energias potential e cinetic inter le coordinatas interne.

Le constantes de fortia assi obtenite, como functiones del constante de interaction $f_{N=O}^{N-O}$, es:

Constante	trans		cis
$f_{N=O}^{N-O}$	-0,90	-1,60	-0,90
f_{N-O}	4,00	4,50	4,00
$f_{N=O}$	10,70	9,90	10,70
f_{ONO}	1,52	1,52	1,33
f_{NOH}	0,772	0,772	0,98
f_{N-O}^{ONO}	0,70	0,70	0,70
f_{N-O}^{NOH}	0,10	0,10	0,10
$f_{N=O}^{ONO}$	0,00	0,00	0,00
$f_{N=O}^{NOH}$	-0,10	-0,10	-0,10
f_{ONO}^{NOH}	0,10	0.03	0,10

Le constantes de tender de ligamine es in mdyn/Å, constantes de angulo es in mdyn Å/rad^2, e constantes de interaction de ligamine con angulo es in mdyn/rad.

Le constantes pro le modo de tender O-H, obtenite per factorisar, esseva 7,42 mdyn/Å pro le forma trans e 6,77 mdyn/Å pro le forma cis.

NOVAS

JOHN D. STRONG, professor de physica experimental al Universitate Johns Hopkins, ha recipite le medalia Frederic Ives del Societate Optic de America "pro labor distinguite in le optica".

* * *

JOHN MURRELL, Commonwealth Fellow 1957-58 del Universitate Cambridge, parlava le 27 de novembre al seminario de physica chimic al Universitate Chicago super le statos electronic de systemas

(continuate al pagina 9)

LE RATION pro que multe homines non acquire jammais le felicitate, le successo, e le plen vita, es que illes pensa semper a se mesme. Illes non ha apprendite le satisfaction de perder se in le vitas e necessitates de alteros.

-- NORMAN VINCENT PEALE.

INTENSITATES INFRARUBIE- NOTA SUPER LE THEORIA DEL METHODO EXPERIMENTAL

J. Morcillo, J. Fernández Biarge, e J. Herranz

Instituto de Chimia Physic "Rocasolano" Serrano 119, Madrid, Espania

(Recipite le 23 de octobre 1956)

U n d i s c u s s i o n theoric in re le methodo experimental pro le determination del intensitates absolute del bandas de absorption infrarubie es date.

Esseva monstrate per Wilson e Wells[1] que si

1) le intensitate del radiation incidente non varia nimis rapidemente a transverso le fissura;

2) le coefficiente de absorption α es constante a transverso le fissura, o le function de fissura $g(\vartheta,\vartheta') = g(\vartheta - \vartheta')$ -- i.e. le potentia de resolution es constante a transverso le largor del banda; e

3) $g(\vartheta - \vartheta') = g(\vartheta' - \vartheta)$;

tunc le

$$\lim_{pL \to 0} B = A, \qquad (1)$$

ubi B es le coefficiente de absorption apparente integrate pro un pression de 1 unitate, e A es le intensitate absolute del banda.

[1] E. B. Wilson Jr. e A. J. Wells, J. Chem. Phys. 14 (1946) 578.

Iste conditiones non es satisfacite in multe casos

Sed iste conditiones del tractamento de Wilson e Wells non es satisfacite in multe casos. Primo, α non pote esser considerate como constante a transverso le largor del fissura spectral que es normalmente usate in le infrarubio, etiam quando un alte pression es usate pro augmentar le largor del banda.

Del altere latere, le hypothese alternative de constante potentia de resolution a transverso del largor del banda vibrational rotational es remote ab le realitate, specialmente pro bandas large, simile al bandas ϑ_1 e ϑ_2 de SO_2, studiate per nos.

Ergo il pare a nos de interesse reexaminar iste materia in terminos plus general pro specificar le requirimentos que es de facto necessari pro le validitate del Eq. 1.

Le area de absorption debe esser invariante

Nos ha trovate que le condition sufficiente pro le validitate del Eq. 1 es le invariante del area de absorption pLC con le potentia de resolution, i.e. que

$$pLC = \int [(T_0 - T)/T_0]\, d\vartheta' = \int [(I_0 - I)/I_0]\, d\vartheta. \qquad (2)$$

Iste invariante del area de absorption con le potentia de resolution es ben-cognoscite a spectroscopistas e discussiones de iste problema ha essite date per plure autores[2-4]. Sed in omne caso illes presupponeva, simile a Wilson e Wells, un function de fissura symmetric e un potentia de resolution que es constante a transverso le largor del banda.

[2] D. M. Dennison, Phys. Rev. 31 (1928) 503.

[3] J. R. Nielsen, V. Thornton, e E. B. Dale, Revs. Modern Phys. 16 (1944) 307.

[4] C. R. De Prima e S. S. Penner, J. Chem. Phys. 23 (1955) 757.

Nos ha derivate Eq.2 per le supposition de conditiones multo minus restrictive--conditiones que es usualmente satisfacite in labor experimental.

Variation del function B(pL)

Le variation del function B(pL) con

le pression total que augmenta le largor del banda, e con le largor spectral de fissura como pL → 0, ha essite considerate. Es monstrate que le function B(pL) ha semper un inclino negative.

Como un corollario de isto, il es monstrate que pro valores finite de pL, B es semper minus que A. Proque B es semper plus grande que C, B se extrapola a A multo plus rapidemente e convenientemente que C -- como esseva jam indicate per Wilson e Wells.

A causa del inclino negative del function B(pL), il es semper possibile constatar con certitude le basse limite del intensitate absolute A, sed isto non es possibile pro le alte limite.

Plus detalios va apparer in An. Real Soc. Esp. Fís. Quím. 52A (1956). Isto es nunc sub pressa.

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INTENSITATES INFRARUBIE E LE DERIVATOS DEL MOMENTOS LIGAMINIC PRO SO_2

J. Morcillo e J. Herranz

Instituto de Chimia Physic "Rocasolano"
Serrano 119, Madrid, Espania

(Recipite le 23 de octobre 1956)

L e i n t e n s i t a t e s absolute del bandas de absorption infrarubie que corresponde al frequentias fundamental de SO_2 ha essite determinate per le methodo de Wilson e Wells[1]. Etiam le causas principal de errores in iste mesurationes ha essite examinate.

Le intensitates absolute pro le bandas $\tilde{\nu}_1$, $\tilde{\nu}_2$, e $\tilde{\nu}_3$ a 1151, 517,5, e 1360 cm^{-1} ($\tilde{\nu}$ = numero de undas), respectivemente, a pressiones e temperaturas normal, es

$$A_1 = 3{,}5 \pm 0{,}2 \text{ THz cm},$$

$$A_2 = 3{,}6 \pm 0{,}3 \text{ THz cm},$$

e

$$A_3 = 26{,}4 \pm 0{,}8 \text{ THz cm},$$

ubi T = tera = 10^{12} , Hz = hertz = cyclo/secunda = s^{-1}, THz = terahertz = 10^{12} cyclo/s = 10^{12} s^{-1}. Iste symbolos esseva recommendate per le Union International de Physica Pur e Applicate in lor "Documento UIP 6" -- vide Physics Today, novembre 1956, ps. 23-27 e Spec. Mol. 6 (1957) 4-6. Etiam recommendate esseva σ o $\tilde{\nu}$ pro numero de undas, como usate supra.

Ex iste valores, le derivatos del momentos ligaminic $\partial\mu/\partial r$ e $\partial\mu/\partial\alpha$ esseva calculate con un function general del energia potential. Le plure possibilitates pro iste derivatos a causa del indeterminatia del signos de $\partial\mu/\partial Q_i$ (Q_i es le coordinata normal i) ha essite considerate. Le valores probabile es

$$\partial\mu/\partial r = 532 \text{ p-u.e.s.}$$

e

$$\partial\mu/\partial\alpha = 248 \text{ p-u.e.s.}$$

ubi p = pico = 10^{-12} (etiam recommendate per le UIPPA) e u.e.s. = unitates electrostatic.

Etiam discutite esseva le limitationes del hypothese de momentos ligaminic pro le molecula SO_2.

Plus detalios va apparer in An. Real Soc. Esp. Fís. Quím. 52A (1956). Isto es nunc sub pressa.

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. . . NOVAS, cont. ab p. 7 . . . . . ☜

molecular composite. Secundo Dr. Murrel, le statos electronic de un molecula es dividite in 2 categorias: un in le qual le electron es excitate intra un parte R del molecula, un altere in le qual le electron es transferite ab un parte R a un altere parte S del mo-

(continuate al pagina 11)

[1] E. B. Wilson Jr. e A. J. Wells, J. Chem. Phys. 14 (1946) 578.

SPECTROS MOLECULAR. III.
TRACTAMENTOS DEL COORDINATAS NORMAL DE MOLECULAS POLYATOMIC
B. APPLICATIONES SPECIFIC

Forrest F. Cleveland, Arnold G. Meister, e Fred L. Voelz
Instituto Technologic de Illinois, Chicago 16, Illinois, Statos Unite de America

(Parcella 12; continuate ab Spec. Mol. 6 (1957) 6)

5D. Constantes del Energia Potential pro CH_4

LE NUMEROS de undas[12] pro CH_4 es date in Tabula 5D1. Pro le vibration de typo

---

Tabula 5D-1. Numeros de undas pro CH_4.

Frequentia	Numero de unda σ in kaysers
$\nu_1(a_1)$	3029,8
$\nu_2(e)$	1390,2
$\nu_3(f_2)$	3156,9
$\nu_4(f_2)$	1357,6

---

a_1, nos obtene

$$\lambda_1 = F_{11}G_{11} = (f_h)(\mu_H) = 4\pi^2c^2\sigma_1^2, \quad (1)$$

ex le qual

$$f_h = 4\pi^2c^2\sigma_1^2/\mu_H = 5,4514 \text{ mdyn/Å}.$$

Pro le vibration de typo e,

$$\begin{aligned}\lambda_2 &= F_{11}G_{11} \\ &= \left[h^2(f_{hh} - 2f_{hh}^{hh})\right]\left[3\mu_H/h^2\right] \\ &= 4\pi^2c^2\sigma_2^2,\end{aligned} \quad (2)$$

ex le qual

$$(f_h - 2f_{hh}^{hh})/h^2 = 0,38255 \text{ mdyn/Å}. \quad (3)$$

Pro le vibrationes de typo f_2, le equation secular in forma expandite es

$$\lambda^2 - (F_{11}G_{11} + 2F_{12}G_{12} + F_{22}G_{22})\lambda + \begin{vmatrix} F_{11} & F_{12} \\ F_{21} & F_{22} \end{vmatrix} \cdot \begin{vmatrix} G_{11} & G_{12} \\ G_{21} & G_{22} \end{vmatrix} = 0. \quad (4)$$

Usante

$$\mu_H = 5,9742 \cdot 10^{23} \text{ g}^{-1},$$

$$\mu_C = 5,0183 \cdot 10^{22} \text{ g}^{-1},$$

e

$$h = 1,093 \cdot 10^{-8} \text{ cm},$$

nos obtene

$$G_{11} = 1,2241 \cdot 10^{40} \text{ g}^{-1} \text{ cm}^{-2},$$

$$G_{12} = -1,2243 \cdot 10^{31} \text{ g}^{-1} \text{ cm}^{-1} = G_{21},$$

e

$$G_{22} = 6,6433 \cdot 10^{23} \text{ g}^{-1}.$$

Con iste valores, Eq.4 deveni

$$\begin{aligned}\lambda^2 &- (1,2241 \cdot 10^{40} F_{11} \\ &- 2,4486 \cdot 10^{31} F_{12} \\ &+ 3,6215 \cdot 10^{29})\lambda \\ &+ 4,3514 \cdot 10^{69} F_{11} \\ &- 7,9821 \cdot 10^{63} F_{12}^2 = 0.\end{aligned} \quad (5)$$

Ex Eq. 2D2 e le numeros de undas date in Tabula 5D1, nos obtene

$$\lambda_3 = 3,5357 \cdot 10^{29} \text{ s}^{-2} \quad (6)$$

e

$$\lambda_4 = 6{,}5389 \cdot 10^{28}\ s^{-2}, \qquad (7)$$

ubi s = secunda. Sed, proque λ_3 e λ_4 es radices de Eq.5, nos pote scriber

$$(\lambda - \lambda_3)(\lambda - \lambda_4) = 0. \qquad (8)$$

Expandente e substituente le valores de λ_3 e λ_4 ex Eqs.6 e 7, nos obtene

$$\lambda^2 - 4{,}1896 \cdot 10^{29}\lambda + 2{,}3120 \cdot 10^{58} = 0. \qquad (9)$$

Equante le coefficientes in Eqs.5 e 9, nos obtene le relationes

$$4{,}3514 \cdot 10^{69}F_{11} - 7{,}9821 \cdot 10^{63}F_{12}^2 = 2{,}3120 \cdot 10^{58} \qquad (10)$$

e

$$1{,}2241 \cdot 10^{40}F_{11} - 2{,}4486 \cdot 10^{31}F_{12} = 5{,}6810 \cdot 10^{28}. \qquad (11)$$

Eliminante F_{11}, nos ha

$$F_{12}^2 - 1{,}0905 \cdot 10^{-3}F_{12} + 3{,}6652 \cdot 10^{-7} = 0. \qquad (12)$$

Infelicemente, le valores de F_{12} obtenite ex iste equation non es real. Isto poterea esser causate per le impossibilitate de usar un expression le plus general pro le energia potential.

Pro obtener le valores del altere constantes del energia potential, il es ergo necessari transferer f_{hh} ab le molecula CH_2Cl. Un tal transferentia del constantes del energia potential inter moleculas de simile structuras es valide pro plure moleculas como Crawford e Brinkley[17] lo ha monstrate. Substituente iste valor, $f_{hh}/h^2 = 0{,}46$ mdyn/Å, in Eq.11, nos obtene

$$f_h^{hh}/h = 0{,}2763 \text{ mdyn/Å}.$$

Iste valores de f_{hh} e f_h^{hh} pote esser verificate per substituer in Eq.10.

Finalmente, le constante f_{hh}^{hh} pote esser obtenite ex Eq.3.

(Va continuar in un numero futur)

. . . NOVAS, cont. ab p. 9 . . . . .

lecula R-S. Le interaction inter iste statos esseva discutite pro alicun simple systemas.

KARL H. HAUSSER del Instituto Max Planck a Heidelberg parlava al mesme gruppo le 18 de decembre super le dependentia de temperatura del spectros e proprietates magnetic de alicun radicales organic. Secundo Dr. Hausser, le radical phenazylo de ethylo normal e le perchlorato blau de Wurster non conforma se al lege de Curie in le stato solide. Iste anomalia es copulate con alicun cambiamentos inusual in le spectros optic a basse temperaturas. Le interpretation de iste datos postula le formation de dimeros ligate per le interactiones inter le electrones π del anulo.

* * *

ANN. REV. PHYS. CHEM. 7 (1956), publicate per Annual Reviews, Inc., Palo Alto, California (costo $7.00), contine inter alteres le sequente articulos:

1) Theoria Quantic. W. Moffitt e C. J. Ballhausen (Univ. Harvard, Cambridge, Mass., S.U.A.), 107-36;
2) Resonantia Magnetic. C. A. Hutchison Jr. (Univ. Chicago, Chicago 37, Ill., S.U.A.), 359-82;
3) Spectroscopia Molecular Electronic. M. Kasha e S. P. McGlynn (Univ. Statal Florida, Tallahassee, Fla., S.U.A.), 403-24;
4) Spectroscopia Vibrational Rotational. R. S. Halford e I. Ichishima

(continuate al pagina 12)

NOVE LIBROS

Lines of the Chemical Elements in Astronomical Spectra (Lineas del Elementos Chimic in le Spectros Astronomic). PAUL W. MERRILL. Carnegie Institution of Washington, 1530 P Street, N.W., Washington 5, D.C. Publication No. 610. (Documentos del Observatorio Mount Wilson, Vol. IX.) 1956. Quarto, vii + 167 ps. Papiro, $1.60; lino, $2.00.

P R O CATA elemento chimic, iste monographia da un breve summario historic sequite per un revista detaliate del presente saper del occurrentia e le characteristicas del lineas de ille elemento in le spectros de varie corpores astronomic, con referentias numerose.

Le bibliographia include un lista descriptive del tabulas publicate del longitudes de unda del lineas in le spectros astronomic.

Un appendice contine:

a) Diagrammas Grotrian -- preparate per Charlotte E. Moore del statounitese Bureau National de Standards -- de quasi omne le elementos e iones de importantia astronomic ab H a Ni, e

b) un breve glossario de terminos astronomic special.

Le libro esseva designate pro le physicos e chimistas tanto como pro le studentes del astronomia. Le section introductori plus le sectiones super H, He, C, O, Ca, e Fe poterea servir como un breve introduction al spectroscopia astronomic.

* * *

Elementary Wave Mechanics, with Applications to Quantum Chemistry (Le Mechanica Undic Elementari, con Applicationes al Chimia Quantic). W. HEITLER. Clarendon Press, Oxford, Anglaterra 2nde edition, 1956. 193 ps. 18 s.

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LE EXISTENTIA de iste periodico depende del receptas financiari ab spectroscopistas, bibliothecas, e companias.

CALENDARIO

**MARTIO 4-8. Conferentia Pittsburgh super le chimia analytic e le spectroscopia applicate. Pittsburgh, Penna.

**APRIL 29-MAIO 1. 8ve symposio annue super spectroscopia. Association American de Spectrographos. Chicago. (T.H. Zink, 4528 W. Division St., Chicago 51, Illinois.)

**APRIL 30-MAIO 3. Colloquio annue super atomos e moleculas ex le recerca radioelectric. (Prof. R. Freymann, Universitate Rennes, Rennes, Francia.)

**JUNIO. Curso laboratorial de estate super le spectroscopia infrarubie applicate. Instituto Polytechnic de Brooklyn, Brooklyn, New York, S.U.A.

**JUNIO 10-14. 11me symposio annue super le spectroscopia e le structura molecular. Columbus. (H. H. Nielsen, Universitate Ohio State, Columbus 10, Ohio)

**JULIO 8-10. 8ve symposio international de astrophysica. Thema: Lineas de Emission -- Stellas. Liege. (P. Swings, Instituto de Astrophysica, Universitate Liege, Liege, Belgica.)

**JULIO. Symposio del gruppo europee de spectroscopistas molecular. Freiburg Germania. (R. Mecke, Universitate Freiburg.)

**1958. Commission Juncte de Spectroscopia. Moscova, U.S.S.R.; o Ottawa, Canada. (P. F. A. Klinkenberg, Laboratorio Zeeman, Muidergracht 4, Amsterdam C, Hollanda.)

☞ NOVAS, cont. ab p. 11 . . . . .

(Univ Columbia, New York, N. Y., S. U. A.), 425-44; e

5) Structura Molecular Experimental. S. Mizushima e T. Shimanouchi (Univ. Tokio, Japon), 445-64.

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Ultraviolet and Visible Absorption Spectra

INDEX FOR 1930–1954

By HERBERT M. HERSHENSON
United Aircraft Corporation,
Hartford, Connecticut
(formerly Wesleyan University)

1956, 205 pp., 8½" x 11", $12.00

THIS BOOK provides an index to the location of ultraviolet and visible absorption spectra of chemical compounds published in twenty-seven representative American and European journals during the twenty-five year period from 1930 through 1954. It includes compounds of interest to biochemists and to organic, inorganic, analytical, and physical chemists.

The volume will greatly simplify the problems of locating spectra and will in many instances eliminate the necessity of obtaining a pure specimen of a compound in order to determine its absorption characteristics. It may also be used as a guide for reagents for the colorimetric determination of elements or compounds.

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Ultraviolet and Visible Absorption Spectra

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1956, 205 pp., 8½" x 11", $12.00

REVIEW: "THIS VOLUME represents a tremendous undertaking. It also demonstrates many of the problems associated with any project for systematizing spectral data. Recognizing these, the author has taken the only path practical for one who does not have unlimited technical, financial, and clerical assistance. After a short preface and introduction, the author has listed by compound approximately 32,000 references by journal, volume, and page where spectra of that compound can be found. Each listing has a code indication of the spectral range covered.

"The twenty-six journals and one book included in the index constitute the main sources of spectral data in the literature...The index itself is quite easy to use. The author has taken the useful step of including spectral data on reaction products and on complexes.

"The rapid growth and wide use of absorption spectroscopy in biology and chemistry make this a very valuable volume."

—Archives of Biochemistry and Biophysics

SAMPLE PAGE

Each reference consists of an abbreviated symbol for the journal, the volume number, the page, and an indication as to whether the spectrum includes the ultraviolet, 200-350 mμ (*), or vacuum ultraviolet, below 200 mμ (**) ranges.

When a reference has the symbol *, it may include the visible portion of the spectrum as well as the ultraviolet, and when it is marked **, it may include the ultraviolet and visible regions as well as the vacuum ultraviolet. If a reference has no asterisk following, it refers to a spectrum covering only the visible region, 350-700 mμ or above.

1-methyl-4-nitromethylene-, JA 73, 3326*
Quinoline, AC 21, 1176*; AC 26, 1124*; B 187, 789*; C (1936), 1577*; C (1951), 478*; C (1952), 4134*; C (1954), 1597; F [5] 1, 715*; FO 270*; JA 68, 2183*; JA 69, 14*; JA 72, 1631*; JA 74, 1554*; JA 74, 4518*; NN [11] 20, 362*; P 9, 106*; ZP B22, 466*
(+ cobalt), JA 53, 2460; JA 72, 5467
(+ iodine), JA 75, 443*
(+ iodoform), C (1936), 1577*
(+ vanadium), N 584, 99*
dicyanide, JA 73, 773*
4-acetamido-, C (1951), 3320*
3-acetyl-1,4-dihydro-, JA 70, 2509*
2-amino-, FO 276*; JA 70, 3404*
3-amino-, JA 70, 3401*
4-amino-, C (1951), 3320*; JA 70, 3404*
5-amino-, C (1951), 3320*; C (1951), 3330*; JA 70, 3401*
6-amino-, C (1951), 3320*; C (1951), 3331*; JA 70, 3401*
7-amino-, JA 70, 3401*
8-amino-, JA 70, 3401*
4-amino-7-chloro-, JA 69, 1096*
6-amino-8-methyl-, N 559, 177*
hydrochloride, N 559, 177*
4-anilino-, C (1951), 3320*
2-(4-anilino-1,3-butadienyl)-, ethiodide, JA 63, 3196
2-(2-anilinovinyl)-, ethiodide, JA 63, 3196
1-benzoyl-2-cyano-1,2-dihydro-, JA 74, 661*
1-benzoyl-2-cyano-2,4-dimethyl-1,2-dihydro-, JA 74, 661*
1-benzoyl-2-cyano-4-methyl-1,2-dihydro-, JA 74, 661*
3-bromo-7-chloro-4-(2-hydroxy-3-diethylaminopropylamino)-, JA 71, 2335*
7-bromo-3-methyl-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3411*
2-chloro-, JA 72, 1631*
4-chloro-, C (1951), 1041*
6-chloro-, JA 72, 1631*
7-chloro-4-n-butylthio-2-methyl-, JA 71, 3734*
5-chloro-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3413*
7-chloro-4-(4-diethylamino-1-methylbutylamino)-, JA 68, 1215*
7-chloro-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3413*
6-chloro-5,8-dihydroxy-, C (1951), 3921*
7-chloro-4-methyl-2-n-butylthio-, JA 71, 3734*
5-chloro-3-methyl-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3413*
7-chloro-3-methyl-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3411*; JA 70, 3413*
3,7-dichloro-4-(4-diethylamino-1-methylbutylamino)-, JA 71, 2335*
5,7-dichloro-4-(4-diethylamino-1-methylbutylamino)-, JA 71, 2335*
5,8-dichloro-4-(4-diethylamino-1-methylbutylamino)-, JA 71, 2335*
6,8-dichloro-4-(4-diethylamino-1-methylbutylamino)-, JA 71, 2335*
5,6-dichloro-4-(2-hydroxy-3-diethylaminopropylamino)-, JA 71, 2335*
6,7-dichloro-4-(2-hydroxy-3-diethylaminopropylamino)-, JA 71, 2335*
7,8-dichloro-4-(2-hydroxy-3-diethylaminopropylamino)-, JA 71, 2335*
4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3413*
4,3′-diethylaminopropylamino-, C (1951), 1041*
2,4-di[(2-ethyl-1(2)-benzothiazolylidene)-methyl]-, ethiodide, JA 59, 71
4-(N′,N′-diethyl-2-hydroxypropylenediamino)-7-chloro-, JA 70, 2986*
4-(N′,N′-diethylpropylenediamino)-7-chloro-, JA 70, 2985*
2,4-di-[(1-ethyl-2(1)-quinolylidene)-methyl]-, ethiodide, JA 59, 69
1,2-dihydro-, JA 74, 4518*
3,4-dihydro-, JA 74, 4519*
2,6-dihydroxy-, BJ 56, 326*
2,4-dihydroxy-Bz-tetrahydro-, H 28, 1686*
2-dimethylamino-, JA 70, 3405*
4-dimethylamino-, JA 70, 3404*
6-dimethylamino-, JA 70, 3401*
2-(4-p-dimethylaminophenyl-1,3-butadienyl)-, JA 63, 3205
methiodide, JA 63, 3205
2-p-dimethylaminostyryl-, JA 63, 3205
methiodide, JA 63, 3205
2-p-dimethylaminostyryl-6-acetamido-, methochloride, BJ 42, 575
(+ suramin), BJ 42, 575
2-fluoro-, JA 72, 1631*
3-fluoro-, JA 72, 1631*
5-fluoro-, JA 72, 1631*
6-fluoro-, JA 72, 1631*
7-fluoro-, JA 72, 1631*
8-fluoro-, JA 72, 1631*
7-fluoro-3-methyl-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3411*
3-iodo-7-chloro-4-(2-hydroxy-3-diethylaminopropylamino)-, JA 71, 2335*
7-iodo-3-methyl-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3411*
2-isopropylthio-4-methyl-, C (1939), 1321*
2-ketotetrahydro-, F [5] 2, 1388*
4-ketotetrahydro-, C (1950), 1490*
4-methoxy-, C (1951), 1041*; C (1951), 3320*; JA 73, 1927*
6-methoxy-8-amino-, JA 70, 42*; JA 75, 2965*
6-methoxy-8-amino-1,2,3,4-tetrahydro-, JA 70, 46*
6-methoxy-7-chloro-4-(4-diethylamino-1-methylbutylamino)-, JA 71, 2335*
2-[1′-methoxy-2-naphthyl]-, H 34, 544*
2-methyl-, FO 272*
4-methyl-, FO 273*
6-methyl-, FO 274*
7-methyl-, FO 275*
3-methyl-5-bromo-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3414*
3-methyl-6-bromo-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3414*
3-methyl-7-bromo-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3414*
3-methyl-8-bromo-4-(4′-diethylamino-1′-methylbutylamino)-, JA 70, 3414*
6-methyl-7-chloro-4-(4-diethylamino-1-methylbutyl-

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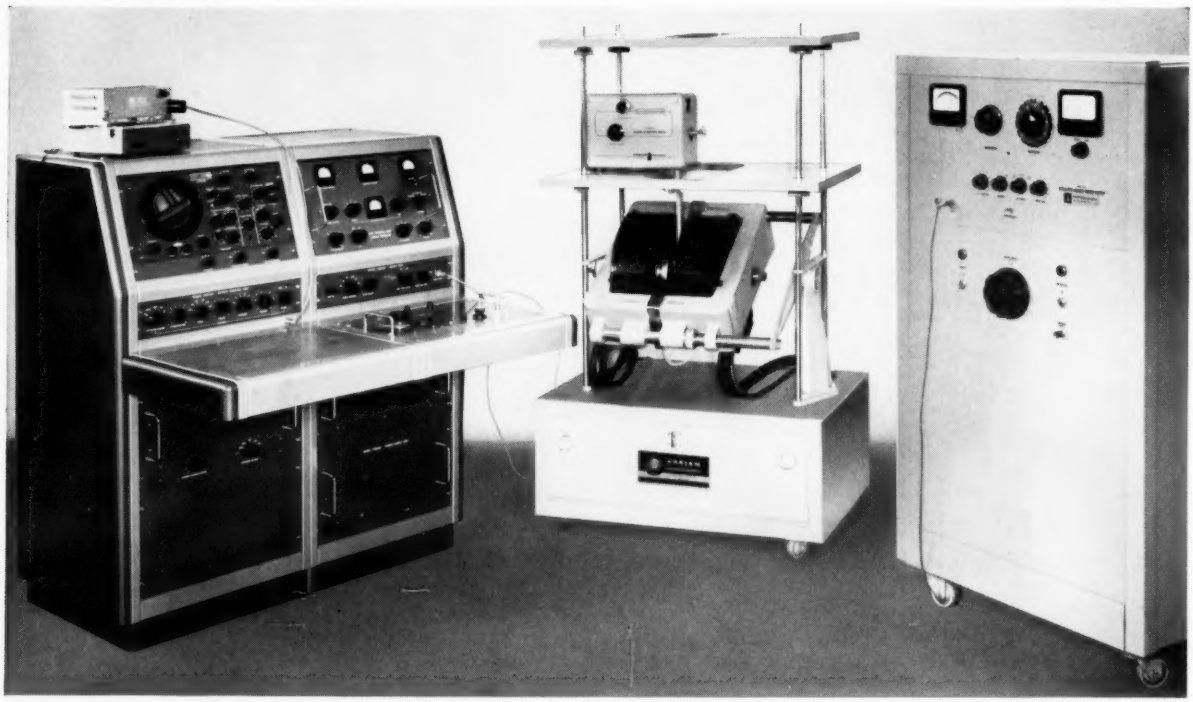

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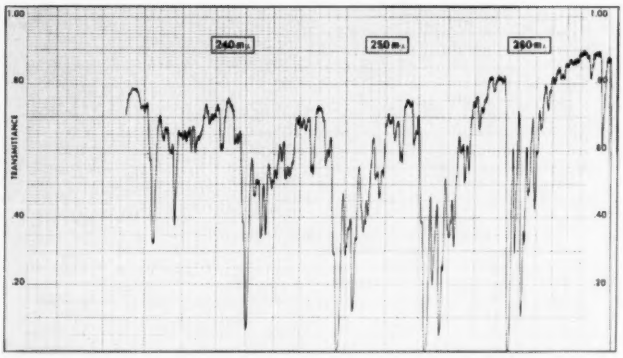

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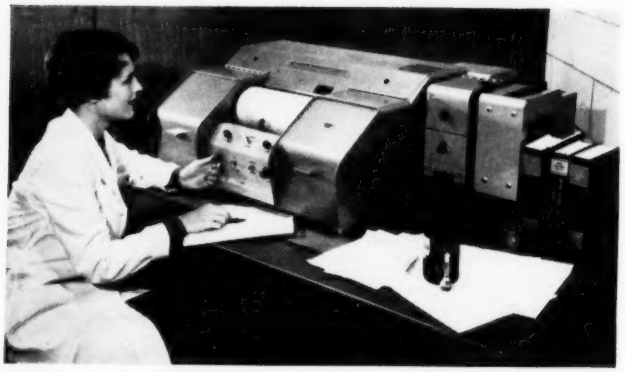

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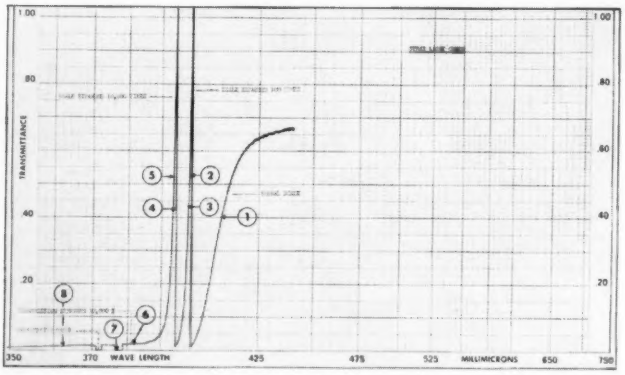

Low scattered light of the instrument is illustrated by the above sodium nitrite run. **(1)** actual transmission of sodium nitrite at 0-100 T scale. **(2)** Scale expanded to read 1% T full scale. **(3)** Run continued with expanded scale. **(4)** Scale expanded to read 0.01% T full scale. **(5)** Same as **(3)**. **(6)** Transmission of sample 0.0002% T. Sample beam closed to show true zero. **(8)** Transmission stray light now 0.0001%.

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